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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-----------------------|------------------|
| 10/620,388 | 07/17/2003 | Hajime Ikuno | 240441US0 | 9623 |
| 22850 | 7590 | 01/28/2008 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | MORILLO, JANELL COMBS | |
| | | ART UNIT | PAPER NUMBER | |
| | | 1793 | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/620,388 | IKUNO ET AL. | |
| | Examiner | Art Unit | |
| | Janelle Combs-Morillo | 1793 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 07 November 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1,5-7,11-15,19,20,24-26,30,31,35,36 and 39-42 is/are pending in the application.
 - 4a) Of the above claim(s) 7,11-14,20,24 and 25 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1,5, 6, 15, 19, 26, 30, 31, 35, 36 and 39-42 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 5, 6, 15, 19, 26, 30, 31, 35, 36, 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over RU 2092604C1 (RU'604) and "Aluminum Standards and data 2003" p 1-6.

RU'604 teaches an aluminum based alloy with 11-25% Si (substantially overlapping the Al-Si hypereutectic range), 1-4.5% Cu, 0.05-2% Ni, 0.1-2% Fe, 0.05-1% Mg, 0.1-2% Mn, 0.01-0.4% Ti, 0.005-0.5% V, 0.01-0.3% Zr (abstract), which overlaps the presently claimed alloying ranges. RU'604 teaches that said alloy has increased strength and elongation (abstract, examples) and can be formed into products by casting. It is held to be within the scope of RU'604 to cast a variety of products/ configurations, including a piston, because RU'604 teaches said alloy can be cast into high strength parts (abstract).

Concerning the instant ranges of P and Ca, "Aluminum Standards and data 2003" p 1-6 teaches Na, Sr, Ca, and/or P are added to 3xx and 4xx type Al-Si foundry alloys in order to modify the structure. "Aluminum Standards and data 2003" teaches 0.005-0.15% Ca and ≤ 0.060% P are effective modifiers. Though the minimum of 0.005%Ca taught by "Aluminum Standards and data 2003" does not fall within the presently claimed range of 0.0005-0.003% Ca,

0.005% is held to be a close approximation of 0.003%. It would have been obvious to one of ordinary skill in the art to use Ca and P as modifiers for the Al-Si alloy taught by RU'604, because "Aluminum Standards and data 2003" teaches Ca and P are effective modifiers for 3xx series Al-Si alloys.

A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), see MPEP 2144.05.

Because the prior art of RU'604 combined with "Aluminum Standards and data 2003" teach a modified Al-Si hypereutectic alloy with overlapping (or close approximation) of the presently claimed alloying ranges, it is held that RU'604 combined with "Aluminum Standards and data 2003" have created a prima facie case of obviousness of the presently claimed invention. Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility.

Concerning claims 5, 15, 35, which mention the "pre-use" Vickers hardness, RU'604 teaches said alloy has excellent strength and hardness (see Table 2, 3). Though RU'604 does not mention the hardness of said alloy, where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Because the prior art

teaches a substantially overlapping alloy composition, wherein said alloy is processed in a similar method of casting, the properties applicant discloses and/or claims (such as Vickers hardness) are expected to be present. See MPEP 2112.01.

Concerning claims 6, 19, 30, 36, which mention “wherein size of non-metal inclusion existing within the piston is less than 100 μm ”, because the alloy taught by RU'604 is substantially overlaps the presently claimed alloy composition (as well as being processed by a similar method of casting and heat treating), then substantially the same non-metal inclusions are expected to be present (see discussion above). Additionally, the examiner points out that said claims are not drawn to *all* inclusions, or *an average*, etc., but said limitation is met by one non-metal inclusion being $\leq 100 \mu\text{m}$.

Concerning new claims 39-42, which mention the transitional phrase “consists of”, though the prior art of RU'604 teaches the presence of Li, Sn, Cd, and S (on the order of ppm), it would have been obvious to remove these (non-essential) elements along with their function, for the predictable purpose of the loss of said function. Alternatively, because said elements are present on the order of ppm, said elements are held to be within the level of “impurities” (cl. 39-42, last line), substantially as presently claimed.

Omission of a step or element and its function is obvious if the function of the step or element is not desired or required, MPEP 2144.04, Ex parte Wu, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989). See also In re Larson, 340 F.2d 965, 144 USPQ 347 (CCPA 1965) (Omission of additional framework and axle which served to increase the cargo carrying capacity of prior art mobile fluid carrying unit would have been obvious if this feature was not desired.); and In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (deleting a prior art switch member and thereby

eliminating its function was an obvious expedient). Note that the omission of an element and retention of its function is an indicia of unobviousness. *In re Edge*, 359 F.2d 896, 149 USPQ 556 (CCPA 1966).

Response to Amendment

3. In the response filed on November 7, 2007, applicant submitted various arguments traversing the rejections of record, and a 1.132 declaration.
4. The declaration under 37 CFR 1.132 filed November 7, 2007 is insufficient to overcome the rejection of claims 1,5,6,15,19,26,30,31,35,36 based upon RU'604 and "Aluminum Standards and data 2003" as set forth in the last Office action because: though the examiner agrees that declarant has shown the Ca is critical in the claimed range of 0.0005-0.003%, it is unclear if the unexpected results occur over the entirely claimed alloying ranges of Si, Cu, Mg, Ni, Fe, Mn, etc. For example, it is unclear if Si in the entire claimed range of 10-21% would be expected to behave in substantially identical manner as the tested compositions, which range from 11.3-13.8% Si. The examiner suggests applicants do all or at least some of the following: a) submit more evidence to be commensurate in scope/create a clear nexus between the evidence and the instant claims and/or b) amend the instant claims to create said nexus between the evidence and the claim language, and/or c) submit an explanation of why the great number and variety of compositions covered by the instant claim language would be expected to behave in a manner consistent with the tested composition.

The nonobviousness of a broader claimed range can be supported by evidence based on unexpected results from testing a narrower range if one of ordinary skill in the art would be able

to determine a trend in the exemplified data which would allow the artisan to reasonably extend the probative value thereof. *In re Kollman*, 595 F.2d 48, 201 USPQ 193 (CCPA 1979).

Said unexpected results are not commensurate in scope with the claimed invention (see MPEP 716.02 d). Whether the unexpected results are the result of unexpectedly improved results or a property not taught by the prior art, the “objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support.” In other words, the showing of unexpected results must be reviewed to see if the results occur over the entire claimed range. *In re Clemens*, 622 F.2d 1029, 1036, 206 USPQ 289, 296 (CCPA 1980).

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RK
ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

JCM
January 10, 2008